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Coping with Credit Risk

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Abstract:
We consider a pool of bank loans subject to a credit risk and develop a method for decomposing the credit risk into idiosyncratic and systemic components. The systemic component accounts for the aggregate statistical difference between credit defaults in a given period and the long-run average of these defaults. We show how financial contracts might be redesigned to allow for banks to manage the idiosyncratic component for their own accounts, while allowing the systemic component to be handled separately. The systemic component can be retained, passed off to the capital markets, or shared with the borrower. In the latter case, we introduce a type of floating rate interest, in which the rate is set in arrears, based on a composite index for the systemic risk. This is shown to increase the efficiency of risk sharing between borrowers, lenders and the capital market.

Executive Summary:
Credit risk is pervasive throughout financial markets. Traditionally, the burden of credit risk has been assumed by different financial institutions. Banks have supported the credit risk attached to bank loans and forward contracts. Credit insurance companies have provided coverage for the commercial credit risk faced by suppliers of consumer and investment goods and services. Public insurers, such as the ECGD in the UK, have specialized in the coverage of credit risk attached to export trade and overseas investment. Specialized institutions, such as factoring companies, have offered credit risk coverage as one component in a basket of financial services. More recently, the

proliferation of financial contracts that entail counter-party default risk - such as swaps, back-to-back loans, and derivative products - have focused attention on ways to deal with credit risk in the marketplace. New products, such as credit default swaps, credit spread options and total-rate-of-return swaps, have allowed firms and financial institutions to more effectively deal with credit risks.

For institutions dealing with credit risk, a particular concern arises from the fact that credit risk has both an idiosyncratic and a systemic component. Counter-party default may arise as a consequence of factors unique to the borrower, such as poor management or bad luck. However, it also may arise in the wider contexts of economic recessions, financial market crashes and political turmoil. This point is certainly underscored by the rate of defaults following the September 11 attacks on the World Trade Center in New York. Defaults can be affected by various common factors, and this results in default rates that are unstable over time. As an example, consider the market for corporate bonds that are rated by Standard & Poor's. There were approximately $4.3 billion in defaults for 1997, whereas in 1991 the value of defaults exceeded $20 billion. Thus, credit risk entails an important systemic component.

In this paper we develop a method for coping with credit risk by decomposing this risk into idiosyncratic and systemic components that may be treated separately. The systemic component basically consists of the difference between credit defaults in a given period and the statistical long-run average of these defaults. We show how this decomposition allows one to optimally manage the two risk components. In particular, we show how some innovation in security design can aid in the treating of the systemic component by allowing a more efficient risk-sharing between borrowers, lenders and the capital markets. The welfare of all market participants is increased by introducing a flexible risk-sharing opportunity.

Since credit risk permeates many different types of financial (and nonfinancial) contracts, we limit our attention to a financial institution that has a pool of contracts exposed to a credit risk. To be more concrete, we refer to a bank with a pool of outstanding loans, although our main ideas are easily generalized to other settings. Our model is rather stylized in order that we may focus on the credit-risk component. Thus, for example, we ignore several important components of overall risk, such as market risk. Also, we focus on the probability of default, with less attention given to the level of partial payback under bankruptcy.

Our paper must be viewed as largely normative. For example, we introduce derivative contracts written exclusively on the systemic component of the credit risk. Although, to the best of our knowledge, such contracts do not currently exist, we show how existing methods can allow for the same result in risk sharing between the bank and the capital markets. We also introduce a type of floating-rate interest, in which the rate is set in arrears and is based on a composite index for systemic risk. This allows borrowers to retain a part of the systemic risk generated by their own

loans. Such floating-rate products do not currently exist in the form we suggest. However, they are essentially a type of structured note, so that our proposed contracts should be viewed more as "evolutionary" than "revolutionary."

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